

### Claims

1                   1.     A method, including steps of determining a set of zones  
2     within a block of data; calculating a zone checksum value for each zone  
3     within said set of zones; recording said zone checksum value for each zone in  
4     association with said block of data; and determining a block portion  
5     checksum value for a portion of said block in response to at least one of said  
6     zone checksum values for each zone.

1                   2.     A method as in claim 1, wherein said steps of determining  
2     a block portion checksum value include determining a partial zone checksum  
3     value for at least one said zone; and combining said partial zone checksum  
4     value with said one zone checksum value.

1                   3.     A method as in claim 1, wherein said steps of determining  
2     a block portion checksum value include determining at least one said zone for  
3     which to compute a partial zone checksum value; determining said partial  
4     zone checksum value in response to a selected portion of said zone; and  
5     combining said partial zone checksum value with said zone checksum value  
6     for at least one said zone.

1                   4.     A method as in claim 1, including steps of receiving said  
2     block of data from a storage medium.

1                   5.     A method as in claim 1, including steps of sending said  
2     block of data and a result of said step of determining a block portion  
3     checksum value to an external device.

1                   6.     A method as in claim 1, including steps of sending said  
2     block of data and said associated checksum values for each zone from a first  
3     software element to a second software element.

1                   7.     A method as in claim 6, wherein said first software  
2     element and said second software element are associated with differing  
3     layers in a data transfer protocol.

1                   8.     Apparatus including memory including a block of data,  
2     said block of data being separable into a set of zones; memory including a  
3     zone checksum value for each said zone; memory including an association of  
4     said zone checksum value with each said zone; and memory including a block  
5     portion checksum value for a portion of said block, said checksum value for a  
6     portion of said block including a combination of at least one of said zone  
7     checksum values.

1                   9.     Apparatus as in claim 8, including memory including a  
2     partial zone checksum value for at least one said zone; and memory including  
3     a combination of said partial zone checksum value with said zone checksum  
4     value for at least one said zone.

1                   10.    A method, including steps defining a partial block of data  
2     from a block of data; determining a set of zones within said block; calculating  
3     a zone checksum value for each zone within said set of zones; recording each  
4     said zone checksum value for each said zone in an array; associating said  
5     array with said block; and combining the checksums within the array.

1                   11.    A method as in claim 10 wherein combining includes a  
2     step of addition.

1                   12.    A method as in claim 10, wherein said step of calculating  
2     a zone checksum values for each zone within said set of zones includes  
3     calculating a partial zone checksum value for any partial zones contained in  
4     said block associating said partial zone checksum with said checksum array.

1                   13.    A method as in claim 10, including steps of receiving said  
2   block from an external device.

1                   14.    A method as in claim 13, wherein said external device is a  
2   Network Interface Card (NIC).

1                   15.    A method as in claim 13, wherein said external device is a  
2   storage medium.

1                   16.    A method as in claim 10, including steps of sending said  
2   block and a result of said steps of combining to an external device.

1                   17.    A method as in claim 16, wherein said external device is a  
2   Network Interface Card (NIC).

1                   18.    A method as in claim 17, wherein said external device a  
2   storage medium.

1                   19.    A method as in claim 10, including steps of sending said  
2   block and said checksum array from a first software element to a second  
3   software element.

1                   20.    A method as in claim 19, wherein said first software  
2   element and said second software element are associated with differing  
3   layers in a data transfer protocol.

1                   21.    A method as in claim 13, including steps of sending said  
2   block and said checksum array from a first software element to a second  
3   software element.

1                   22.    An apparatus including memory including a block of data,  
2   said block being separable into a set of zones; said memory including a zone

3 checksum value for each said zone; said memory including an association of  
4 said zone checksum values with each said zone; and memory including a  
5 checksum array including a combination of each said zone checksum values.

1           23. Apparatus as in claim 22, including memory including a  
2 partial zone checksum value for at least one said zones; and memory  
3 including a combination of said partial zone checksum value with said zone  
4 checksum value for at least one said zone.

1           24. Apparatus as in claim 22, wherein said memory includes  
2 at least one said partial zone for which to compute a partial zone checksum  
3 value; said memory includes said partial zone checksum value associated  
4 with a selected portion of said partial zone; and said memory includes a  
5 combination of said partial zone checksum value with said zone checksum  
6 value for at least one said zone.